



Imation Storage Networking Lab
1 Imation Place, Oakdale, MN 55128

Certified for HP-UX

PCI Fibre Channel Device Certification Acceptance Report

Date: February 14, 2003

Congratulations! The product you have submitted to Imation has successfully met the compliance criteria and has been accepted. Your product is now officially "Certified for HP-UX"! Below, you will find specific details concerning all of the tests performed.

Vendor and Product Description

Vendor: Emulex Corporation

Product: LP9002L-F2 Fibre Channel HBA

Software: LPFC Light Pulse Adapter Driver A.04.11.08

Description: Single port 2Gb Emulex HBA

Vendor Supported Hardware Platforms

- HP-UX 9000 rp2450 Server
- HP-UX 9000 rp5450 Server
- HP-UX 9000 rp7400 Server



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- HP-UX 9000 rp8400 Server
- HP-UX 9000 rp7410 Server
- HP-UX 9000 A5202A Superdome PA-8700 Server

Vendor Supported Operating System Environments:

- HP-UX 11.i

HP-UX 9000 System Compliance Requirements

The product successfully meets the compliance criteria for HP-UX 9000 Systems as defined by Hewlett Packard. The following section outlines the product testing requirements:



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Section 1.0 - Platform Testing: Testing the product on each of the specified hardware platforms.

Section 2.0 - Operating Environment Testing: Testing the product on each of the specified operating system environments.

Section 3.0 - Documentation Compliance Verification: Verifying the product documentations correctness and completeness.

Section 4.0 - PCI Slot Testing: Verification that the card functions in different types of PCI card slots.

Section 5.0 - Driver Installation and un-Installation Testing: Verifying that the product installs and uninstalls properly.

Section 6.0 - HP-UX Functional Command Testing: Verifying product command testing as defined by Hewlett-Packard testing certification documentation.

Section 7.0 - Stress Testing: Verifying the product does not fail under heavy I/O traffic.

Section 8.0 - HBA Recovery Testing: Verifying the recovery ability of the card in the event of device power fails and cable disconnects.

Section 9.0 Diagnostic Testing: Verifying vendor supplied diagnostic tools to perform as expected.

1.0 Platform Testing

The product submitted was successfully tested for certification compliance on each of the following platforms:

- **RP-2450**
 - Firmware 42.19
 - Using HP-UX 11i
- **RP-5450**
 - Firmware 41.39
 - Using HP-UX 11i
- **RP-7400**



- Firmware 42.06
 - Using HP-UX 11i
- **RP-8400**
 - Firmware 42.28 (PDC ver16.009)
 - Using HP-UX 11i
- **RP-7410**
 - Firmware 42.28 (PDC ver16.009)
 - Using HP-UX 11i
- **A5202A Superdome PA-8700**
 - Firmware 35.4
 - Using HP-UX 11i

2.0 Operating Environments Testing

The product submitted was successfully tested for certification compliance on each of the following platforms:

- HP-UX 11i
 - Hardware Enablement Patches, June 2002, 11.11.0206.5
 - Support Tools Bundle, March 2002, B11.11.06.04
 - HP-UX ANSI C Compiler, B.11.1.04
 - Perl 5.6.1.C
 - Apache version 1.3.19.23
 - LPFC Light Pulse Adapter Driver A.04.11.08

Comments and Observations:

HP-UX 11i software was supplied by HP. HP also provided the HP-UX ANSI C compiler, Perl 5.6.1 in SD Depot format. The LPFC 64-bit driver was supplied in depot format. Exceptions to the above list include the RP-2450 installed without the Software Bundle and the Superdome installed without an ANSI C Compiler.



3.0 Documentation Compliance

The product successfully meets the compliance criteria for the Documentation Requirements as defined by Hewlett Packard. Specific installation instructions were available, specifying when user intervention is required for installation to an appropriately configured and localized HP-UX platform(s).

Comments and Observations:

The commands given to rebuild the kernel are not HP standard. The kernel should be rebuilt in the '/stand/build' directory with the kmupdate command issued after kernel build is completed. This will insure recoverability in case of invalid or corrupt kernel. Also, the shutdown command should be used instead of the reboot command. The shutdown command requires the system to execute system shutdown scripts and is therefore much 'cleaner'. Usage of the shutdown command precludes the need to issue the 'sync' command.

In issuing the 'swinstall -s `pwd`/lpfc.depot -x autoreboot=true LPFC command (Chapter 3, instruction 3.2), you are not given the choice to modify the kernel as indicated in the next instruction.

4.0 PCI Slot Testing

The product successfully meets the compliance criteria for PCI Slot Testing as defined by Hewlett Packard. Testing was performed with the product in each I/O slot type supported by the HP-UX system. HP-UX slot types used were shared, turbo and twin turbo. IOSCAN and LSDEV were used to verify that the card was recognized by the HP-UX system.

Comments and Observations:

No comments or issues to report.

5.0 Driver Installation and un-Installation Testing

The product successfully meets the compliance criteria for Installation and removal as defined by Hewlett Packard. The product must install properly, uninstall completely, and reinstall properly. The product should also correctly handle an install attempt if the product is already installed by installing properly or aborting with notification.

Comments and Observations:

No comments or issues.

6.0 HP-UX Command Functionality Testing

The product successfully meets the compliance criteria for HP-UX Functionality as defined by Hewlett Packard. These tests validate that the HP-UX system



recognizes the card properly and that the product is installed and functioning. Standard HP commands to prepare disks for use, create file systems and use those file systems were issued against all devices.

Comments and Observations:

Testing was performed with the product in each I/O slot type supported by the HP-UX system. HP-UX slot types used were shared, turbo and twin turbo. Standard HP disk and raid devices were used in conducting these tests.

One caveat is that the device does not support booting the operating system and is not recognized by the system prior to operating system initialization therefore you can not load the operating system via this device.

7.0 Stress Testing

The product successfully meets the compliance criteria for Stress testing as defined by Hewlett Packard. Tests include running for an extended period of time while under load provided by test tools. The product must meet standard performance expectations for the product type and must not fail or cause conflict with other software or the operating system during these tests.

Comments and Observations:

Stress and load testing was performed using a tool supplied by HP. The tool performed a series of tests that exercised the capabilities of the HBA over an extended period of time. Test Logs, System Logs and CPU utilization were monitored during this test run.

8.0 HBA Recovery Testing

The product successfully meets the compliance criteria for HBA Recovery testing as defined by Hewlett Packard. These tests are performed on loop devices only with an I/O generating program running against the disk device. Tests include:

- Cable Disconnect
 - Disconnect cable for 10 seconds.
- Abrupt power loss of a disk device
 - Test recoverability of driver in a disk device power loss scenario.
- Target Hot Swap
 - Test whether or not device maintains loop ID when ports connections are changed live.



Comments and Observations:

There was a firmware issue on an HP disk device uncovered during this test. The specific device that had an issue was HP part number “A5234A” (18Gb Seagate ST318203FC) with a firmware revision of HP02. The issue involved the device not recovering correctly during the abrupt power off test. The device in question had to be hard reset by itself or the cable to the disk device had to be disconnected and then reconnected in order for the device to recover.

9.0 Diagnostic Tools

Emulex provided the ‘lputil’ tool useful for diagnostic and informational purposes. “lputil” can:

- Display a list of adapters
- Adapter information
 - PCI Configuration parameters
 - Adapter revision levels
 - Wakeup parameters
 - IEEE address
 - Loop map
 - Status and counters
 - Link status
 - Adapter configuration parameters
- Perform Firmware maintenance
- Reset Adapter

Comments and Observations:

It should be noted that the firmware upgrade functionality was not tested.

Testing Configuration Summary

Testing was setup with each HP-UX 9000 system configured with the latest firmware and a standard OS installation. Testing configuration details of systems and devices is outlined in the HP-UX Fibre Channel Certification Test Plan for Single Fibre Channel



HBAs. Please see section 1.0 of this document for Platforms tested. The following storage devices were tested with the Emulex product:

- HP Virtual Array VA-7100
- HP Virtual Array VA-7400
- HP SureStore E Disk System FC-10 (A5436a)
- HP SureStore FC 2GB switch
- HP SureStore Long Wave FC HUB (A4831AZ)
- HP SureStore Short Wave FC HUB (A3724AZ)

Topology tested included both Fabric and Arbitrated loop, with a mix of one and two Gb speeds setting.

NOTE: HP does not endorse or is any way liable for support of any peripherals that may be connected to this HBA even if they have been used/referenced in the test configuration.



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